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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/764,523	01/18/2001	Kiyoshi Satoh	ASMJP.055AUS	6412

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EXAMINER

WINTER, GENTLE E

ART UNIT PAPER NUMBER

1746

DATE MAILED: 08/13/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/764,523

Applicant(s)

SATO ET AL.

Examiner

Gentle E. Winter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 33-45 is/are pending in the application.
- 4a) Of the above claim(s) 41-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 33-40 & 45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 33-35, 37-40, and 45 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 5,788,778 to Shang et al.

3. Specifically, claim 33 is drawn to a method of cleaning a chemical vapor deposition (CVD) reaction chamber with cleaning gas provided through a remote plasma discharge chamber. The method comprising the steps of dissociating cleaning gas within the remote plasma discharge chamber. Disclosed by Shang as a “remote activation chamber. See e.g. column 5, line 8 *et seq.*

4. Claim 33 further discloses applying energy with a power of less than about 3,000 Watts. Shang discloses “about 3,000-12,000 Watts”. See e.g. column 5, line 8 *et seq.* Claim 33 discloses supplying activated species from the remote plasma discharge chamber to the reaction chamber through a piping and removing adhered deposits from CVD reactions on a wall of the reaction chamber at a rate of greater than or equal to about 2.0 microns/minute. Figure 1 of Shang discloses the pipe and because each and every limitation in the claim is present in Shang, inherently the rate of removal will also be the same, even if the same is not identically disclosed.

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5. As to claim 34, disclosing that the deposits on the reaction chamber wall comprise silicon nitride. The same is disclosed in Shang at see e.g. column 6, line 12.

6. As to claim 35, disclosing that the cleaning gas comprises fluorine-containing gas and the activated species comprises fluorine active species. The same is disclosed in Shang at see e.g. column 6, line 12. Specifically  $\text{NF}_3$ .

7. As to claim 37, disclosing that supplying activated species comprises flowing  $\text{NF}_3$  through the remote plasma discharge chamber at a rate between about 0.5 slm and 1.5 slm. Shang discloses the  $\text{NF}_3$  at e.g. column 6, line 12 and the flowrate at see e.g. column 5, line 9 *et seq.* It is noted that “about 2” is read to include the claimed “about 1.5”, if applicant prefer a different reading applicant is requested to make the record clear as to how applicant would like “about” to be construed.

8. As to claim 38, disclosing opening a valve on the piping after conducting a CVD reaction and prior to supplying activated species. The same is disclosed at see e.g. column 5, line 15 *et seq.* especially at line 23 *et seq.*

9. As to claim 39, further limiting claim 38, and disclosing that opening a valve comprises withdrawing a sealing element completely from a path to form an opening substantially as wide as internal surfaces of the piping. Shang discloses a needle valve at column 5, line 15 *et seq.* especially at line 23 *et seq.*

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10. As to claim 40, further limiting claim 38, reciting the step of closing the valve after removing the adhered deposits. This is disclosed at column 5, line 15 *et seq.* and is consistent with all known cleaning procedures.

11. As to claim 45, disclosing that the power supplied is between 2,000 and 3,000 Watts, Shang discloses “about 3,000-12,000 Watts”. See e.g. column 5, line 8 *et seq.*

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shang, as discussed above and United States Patent No. 5,844,195 to Fairbairn et al (Fairbairn).

Each and every limitation of claim 36 is disclosed in Shang as set forth above, except that Shang fails to explicitly disclose that the applied energy has a frequency between about 300 kHz and 500 kHz. Fairbairn discloses the missing element and explicitly provides the motivation for making the instant combination. Specifically Fairbairn discloses that “[i]n the dry cleaning process, \*\*\* with regard to the RF power source, any of a wide range of frequencies (e.g., 400 KHz to 13.56 MHz) are typically used to generate plasmas”. Fairbairn goes on to disclose: “In general, however, it should be understood that the power levels, flow rates, and pressure that are

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chosen are system specific and thus the will need to be optimized for the particular system in which the process is being run. Making the appropriate adjustments in process conditions to achieve optimum of performance for a particular system is well within the capabilities of a person of ordinary skill in the art.

***Conclusion***

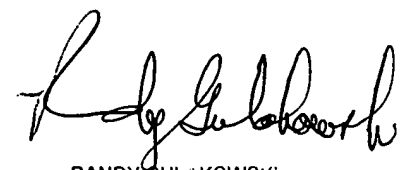
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gentle E. Winter whose telephone number is (703) 305-3403. The examiner can normally be reached on Monday-Friday 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (703) 308-4333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications. The direct fax number for this examiner is (703) 746-7746.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gentle E. Winter  
Examiner  
Art Unit 1746

August 6, 2003

  
RANDY GULAKOWSKI  
SUPERVISORY PATENT EXAMINER  
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